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# Eating disorders and associated mental health comorbidities in female veterans



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## ABSTRACT

Eating disorders (EDs) remain understudied among veterans, possibly due to the perception that primarily male population does not suffer from EDs. However, previous research suggests that male and female veterans do experience EDs. The high rates of posttraumatic stress disorder (PTSD), depression, and obesity observed among veterans may make this group vulnerable to disordered eating. Retrospective chart review was used to obtain data from 492 female veterans who were presented to a women's primary care center at a large, urban VA medical center between 2007 and 2009. A total of 2.8% of this sample had been diagnosed with an ED. In bivariate analyses, presence of PTSD and depression were significantly associated with having an ED diagnosis. However, when these two disorders were included in a multivariate model controlling for age, only depression diagnosis and lower age were significantly related to ED status. In sum, the rate of EDs in this sample is comparable to prevalence estimates of EDs in the general population. Current findings underscore the importance of assessing for EDs among VA patients and the need for further research among veterans.

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## 1. Introduction

The issue of eating disorders (EDs) in veterans has recently received increasing attention due to several factors. First, a large proportion of service members in the current conflicts in Iraq and Afghanistan is younger than veterans from previous conflicts and may be more susceptible to EDs (Curry et al., 2014). Second, given the high rate of overweight and obesity among veterans (Vieweg et al., 2007), ED behaviors may persist or develop following discharge from service as veterans attempt to lose or control their weight. Third, approximately 75% of individuals with anorexia nervosa (AN) and bulimia nervosa (BN) are female (Hudson et al., 2007), and the number of female service members has increased markedly during the current conflicts. Fourth, exposure to potentially traumatic experiences may put male and female service members and veterans at increased risk for EDs (Forman-Hoffman et al., 2012; Mitchell et al., 2012), as disordered eating behaviors may be used to cope with negative affect (Heatherton and Baumeister, 1991).

In a sample of female veterans seeking outpatient treatment for trauma-related mental health conditions, 12.9% reported binge eating, 3.9% reported purging, and 8.2% reported extreme caloric restriction as a method of weight regulation (Rowe et al., 2009). In addition, a recent study found that 78.2% of a sample of male and female veterans seeking weight loss treatment reported clinically significant binge eating (Higgins et al., 2013). Two recent studies examined EDs in more general VA samples. One investigation of 1004 female veterans found that 4.7% had been diagnosed with an ED, and an additional 11.5% reported that they had ED symptoms (Forman-Hoffman et al., 2012). A second study administered the Structured Clinical Interview for the DSM-IV and found that 4.6% of female veterans ( $n=346$ ) and 0.7% of male veterans ( $n=1354$ ) of the current Iraq and Afghanistan conflicts had a lifetime history of any ED (Curry et al., 2014). Thus, EDs affect a considerable number of female veterans. Nevertheless, EDs remain understudied in this population. Further, VA has no national screening or treatment programs for EDs, underscoring the potential need for additional treatment implementation research.

The current investigation therefore sought to describe rates of EDs and their correlates in a sample of female veteran primary care patients. This sample represents a broader population of female veterans than those directly seeking inpatient or outpatient mental health care; in addition, primary care settings represent an

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important point for VA care entry generally, and provide opportunities for both early detection and coordinated medical and behavioral treatment of EDs that may present but remain under-treated in the context of more apparent trauma-related disorders such as PTSD or depression. We hypothesized that rates of ED diagnoses would be similar to those in the general population and that rates of psychiatric disorders would be greater among women with EDs than those without EDs.

## 2. Methods

### 2.1. Participants

Data from the VA electronic medical record system were obtained from 492 female patients identified as having received services in the VA Boston Healthcare System primary care clinic between December 2007 and December 2009.

### 2.2. Procedures

The investigation was carried out in accordance with the latest version of the Declaration of Helsinki. Chart review procedures approved by the Institutional Review Board at VA Boston were used to obtain data for the following study variables.

### 2.3. Measures

Study variables included current ICD-9 and DSM-IV (American Psychiatric Association, 2000) psychiatric diagnoses, smoking status, race, age, and body mass index (BMI). BMI was assessed by recording the three most recent measures and taking their average. Psychiatric diagnoses were combined into categories: any ED, PTSD, anxiety disorders (other than PTSD), depressive disorders, alcohol use disorders, substance use disorders, personality disorders, bipolar disorders, psychotic disorders, and adjustment disorders.

### 2.4. Statistical analyses

Analyses were conducted using SAS 9.3. Fisher's exact tests were used to compare dichotomous variables between participants with and without EDs; *t*-tests were used for continuous variables. Logistic regression models were used to assess the relative contribution of age and psychiatric disorders to ED status.

## 3. Results

The participants' mean age was 52.12 (S.D.=17.12). On an average, the participants were overweight ( $M_{\text{BMI}}=29.22$ , S. D.=6.98; Range: 14.48–67.00). Approximately half (54.5%) were Caucasian, 18.7% were African-American, 1.4% were Hispanic/Latina, 1.8% were Asian, 1.0% were Native American/Pacific Islander, and 22.5% were unknown. Of the 492 participants, 2.8% had an ED diagnosis. The majority were diagnosed with eating disorder not otherwise specified, two had AN, and one had BN. Twenty-three percent of the participants were current smokers.

Women with EDs ( $M_{\text{age}}=40.57$ ) were significantly younger than women without EDs ( $M_{\text{age}}=52.46$ ;  $t_{484}=2.57$ ,  $p=0.01$ ). Race (Fisher's exact  $p=0.12$ ) and smoking status (Fisher's exact  $p=1.0$ ) did not differ by ED status. Women with EDs were more likely to have a PTSD diagnosis (57.1%) compared to women without an ED (25.9%; Fisher's exact  $p=0.01$ ). In addition, women with an ED were significantly more likely to have a diagnosis of a depressive disorder (71.4%) compared to women without an ED (32.0%; Fisher's exact  $p=0.003$ ). There were no other differences in rates of psychiatric disorders for women with vs. without EDs (all  $p > 0.05$ ).

Age, PTSD, and major depression were entered as independent variables in a logistic regression model. Results revealed that age (OR=0.95, 95% CI: 0.90, 0.99,  $p=0.01$ ) and depression (OR=4.59, 95% CI: 1.26, 16.73,  $p=0.02$ ), but not PTSD (OR=1.67, 95% CI: 0.51, 5.48,  $p=0.40$ ), were associated with increased likelihood of having

an ED diagnosis. Thus, younger female veterans may be more likely to be diagnosed with an ED, and EDs were most strongly associated with comorbid depression.

## 4. Discussion

In the current study, 2.8% of female veteran participants had a current ED diagnosis, supporting previous findings that EDs are at least as common among veterans as the general population (Forman-Hoffman et al., 2012). Of note, this may be an underestimate, given previous findings that EDs are unlikely to be diagnosed in hospital and clinic settings. Specifically, a previous study found that only half of BN cases had been detected in a primary care practice (Whitehouse et al., 1992). Patients may present themselves to primary care complaining of physical conditions, which may be related to their ED, without disclosing ED symptoms (Carney and Yates, 1998). Our rate was somewhat lower than rates reported by previous studies which assessed EDs using interview methods (Curry et al., 2014). Thus, the actual number of cases in our sample likely is substantially higher.

Consistent with previous findings, EDs were associated with both PTSD (Mitchell et al., 2012) and depressive disorders (Curry et al., 2014) at the bivariate level. However, in the full model, only depressive disorders were associated with increased likelihood of having an ED diagnosis, suggesting that depression is more strongly associated with EDs than is PTSD. Although it was impossible to determine which disorder preceded the onset of the other in this cross-sectional dataset, our findings are consistent with the hypothesis that ED symptoms may serve, in part, to cope with negative affect. However, other explanations must be considered, including that comorbidity of these disorders may be due to common biological or genetic vulnerabilities that increase risk for both. Additional psychosocial factors may also account for their correlation. Finally, younger age was associated with having an ED, consistent with results from the National Comorbidity Study-Replication suggesting that risk for bulimia and binge eating disorder is increased with younger cohorts (Hudson et al., 2007).

There are several important limitations to the current study, in addition to the cross-sectional design. The small number of women with EDs may have limited our ability to detect significant findings or to examine differences between various ED diagnoses. It was not possible to determine what method healthcare providers used to assess EDs (e.g., structured interviews or inclusion of questions about EDs as part of a medical review of systems) or how routinely queries about the possible presence of an ED are made. Although no previous investigations have examined the accuracy of ED diagnoses in VA, several have examined the validity of other mental health diagnoses in patients' medical records. For example, (Kim et al., 2012) found a sensitivity of 55% for alcohol abuse/dependence and 61% for illicit drug abuse/dependence. Specificity values were 97% and 99%, respectively. These findings were consistent with previous studies (Kashner, 1998). High specificity and low sensitivity likely result in under-estimation of rates of diagnoses in VA (Kim et al., 2012). As VA currently does not have systematic screening procedures for EDs, EDs must be severe enough for healthcare professionals to be suspected and detected, or the patient must report symptoms. Stigma may dissuade many people with EDs from reporting them to their healthcare providers (Roehrig and McLean, 2010). In addition, although the VA medical record system prompts healthcare providers to screen for depression, PTSD, and alcohol use at least annually, some patients may choose not to report their symptoms in the primary care setting, due to stigma or concerns about being prescribed medication or other treatments for which they are unprepared (Bell et al., 2011).

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